

ABSTRACT

An ultrasonic energy source is used to provide a variable force for measuring the binding forces between molecular entities and for sensing the presence of an analyte in a test sample. The device includes a surface that has a first binding member attached thereto and one or more particles that have a second binding member attached thereto. A reaction vessel is provided for exposing the surface to the particles whereby, if the first binding member has a binding affinity for the second binding member, a complex is formed between individual first binding members and individual second binding members and the particles thereby become immobilized with respect to the surface. The ultrasonic energy source is positioned for applying a variable ultrasonic force onto the surface, and the position of the particles is monitored as the intensity of the ultrasonic force is varied.